The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

BOUVERIE HOUSE, 154 FLEET STREET, LONDON, E.C.4

Telegrams: ALLANGAS FLEET LONDON
Telephone: CENTRAL 3212 (10 lines)
GLASGOW: 116, Hope Street (Central 3970)
BIRMINGHAM: Daimler House, Paradise Street (Midland 0784-5)
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Transport

THE importance of transport is being prominently brought to the notice of everyone by current events. Mechanisation of armies has brought with it problems in supply that did not affect the armies of the last century, armies that could live largely on the country through which they marched. The Germans, faced for the first time in this war with long and difficult lines of communication, are finding their vaunted efficiency put to a terrible strain, this strain being all the greater for their traditional inability to improvise. We in this country have been compelled by geography to spread our ships over all the seven seas. Our armies are far-flung. We must cover the world with our transport. In our own country we have the advantage of good railways, excellent roads, and a useful river and canal system, coupled with no shortage of the necessary fuels. But the war-time volume of traffic is such as to throw a strain upon even these excellent communications. Enemy action has not impeded and does not impede transport here, but the shortage of man-power and the need for making the best use of every vehicle has caused the Government to launch the "Q" campaign for the quicker turn-round of vehicles needed for the movement of war supplies—and this in effect means practically every commercial vehicle outside the tradesmen's carts engaged in daily rounds.

The road haulage branch of the Ministry of Transport is also to put into force a scheme to provide a fleet of vehicles under continuous Government control, and to arrange through one channel most of the long-distance road movements of important national traffic. Clearing houses are to be set up for the road movement of Government traffic and there will be built up a fleet of 2500 vehicles in addition to the 1600 already chartered for the movement of meat.

These schemes indicate in some measure the immense task of transportation, and the waste that ensues in our present individualistic organisation of traffic. The experience in organisation that will be created should not be allowed to die with the end of the war. The cost of transport is a major cost, perhaps *the* major cost, of manufacture and distribution. If time and money can be saved in war time by organisation, why not also in peace time? This appears to be a subject to which planning committees have given no thought: at least until recently we had seen no mention of it anywhere, if we except a suggestion in P.E.P. broadsheet No. 176 that our first task after the war should be the restoration of our transport system to a state of efficiency. A few days ago, however, Lord Leathers, Minister of War Transport, did refer to this aspect of the problem. "Much of what is happening in home transport to-day," he said, "necessitating as it does a sensible working together of rail, road and water carriage, should prove useful for a sound system of national planning in the future."

Transport dominates every sphere of activity. Many excellent industrial projects never get farther than the blue-print stage because the cost of transport rules them out. It is not too much to say that transport difficulties are among the greatest brakes on progress. The real cost of transport to a manufacturer is not just the direct cost for raw materials or finished product; it is the cost also of transport on the whole cost of living of his employees, on everything they use, wear, or eat, and thus on wages. A writer has recently pointed out that whilst there are no comprehensive statistics readily available, apart from the published statistics of the railways, the total pre-war cost of transport in this country (with the ancillary services) may be estimated as more than £750,000,000, or 6s. 4d. a head of the population. After the war it may well be greater still.

Even in this time of national organisation, it has been stated that "there is great overlapping and waste arising from the lack of co-ordination of transport services as to time or geography." Failure to deal with transport scientifically as a national problem has far-reaching effects in the realm of costs. Whatever argument is valid now seems to be equally applicable to the days of peace. The dead hand of transport costs, and the difficulties of geographical separation of manufacturers and markets, or of manufacturers and raw materials, can be minimised if adequate attention is given to this aspect of planning. Where speed is not the essence of the problem, the cheapest possible means should be used. The cheapest means is by water. Why were the railways allowed to purchase and virtually close our canals? Frequently, the time taken by the railways even in peace was not shorter than that by water, and the costs were much higher. Let us then use water as much as possible for transport. Why should not the cost of fuel be reduced by 10s. or more a ton by conveying coal in water through trunk mains? Technologists know that these things can be done, and done cheaply. Let us sweep away hindrances due to established interests, and tackle this problem of transport by modern scientific methods. It has been said in relation to our war effort that the proper organisation of transport would contribute more than any other single factor to a quickening of the pace in all fields. Properly ordered it would make a direct contribution to the solution of our economic problems. It would also lay the foundations for reconstruction after the war.

NOTES AND COMMENTS

Women in Chemical Works

ADMITTEDLY there are difficulties involved in the employment of women in chemical works. That they are not insuperable, however, is shown by a pamphlet just issued by the Chemical Control Board of the Ministry of Supply, representing a joint effort on the part of chemical industrialists and the workers themselves. Early in the war the view was that the employment of women in chemical works would necessarily be severely limited. However, certain firms which have put the matter to practical test have found that women can be substituted for men to a far greater extent than was thought possible, provided attention is given to certain points. There is now, indeed, a considerable volume of experience to show that women can do practically every job a man can do, apart from those requiring sheer physical strength. Many firms have employed women as assistants to process workers or as chemical labourers to liberate men for process and heavy work, but there are many jobs women have successfully undertaken which might not normally occur to managements or works managers. The pamphlet contains a list of actual jobs in which women have successfully replaced men, and this list is based on reports of work actually being done by women. Discussions between managements and the workers have been fruitful in producing suggestions. Modification has been found necessary in the case of certain heavy jobs, but changes have usually consisted merely in reducing the sizes of packages, containers, etc., and the weight of tools to be handled, and providing lifting tackle. In heavy work, three women to replace two men seems to be the usual ratio. Supervision by an experienced man is a great help, and, subject to proper safeguards, women have tackled really heavy work, especially in loading vehicles and machines.

Limitations of Female Labour

UNDER the Factories Act, however, there are legal restrictions on the employment of female labour in certain processes and in regard to shift work and overtime. Women have not been able to replace men in certain processes where there is heavy manual work, where heat, noxious gases, or considerable discomfort are involved, and where certain dangerous or toxic materials are handled. There are medical reasons why women should not be employed on handling certain materials, such as pitch and coal tar, and the Factories Act restricts the employment of women in certain processes, *e.g.*, lead, nitro, and amido processes. Due note is taken of these restrictions in the pamphlet, and attention is called also to the provisions by which shift work and overtime can be arranged with the assistance of the Factory Inspector, especially when continuous processes are involved. Short shifts have made possible the use of older women, and in general it is important not to allow women to work too long hours. Only one firm, so far, reports the introduction of part-time women employees (*i.e.*, under eight hours), but it is hoped that this method will develop and that more information on its working will soon become available. Provisions necessary for welfare appear, in the main, to consist merely of commonsense, but it is noted that special women supervisors, where appointed, have been a great success. One point specially stressed is the value of properly organised arrangements to introduce new women workers to factory conditions, to explain their work in relation to the factory as a whole, safe methods of working and similar matters which help them to fit more easily into their job. An outline of a scheme adopted by one firm for this purpose is available on request from the Chemical Control Board.

Paper or Fertiliser ?

WHEN Lord Beaverbrook began his waste-paper drive a short while ago, probably very few people imagined that it would have any repercussion on agriculture. Lord Bledisloe, however, who keeps a watchful eye on the humus problem and the maintenance of land fertility, as we noted in our leading article on November 1, has discovered a way in which by augmenting the supply of raw materials for paper and similar products, we may unwittingly be detracting from the fertility of the soil. In a letter to *The Times* he points out that farmers, with Government endorsement, and contrary to agricultural practice, are selling large quantities of baled straw to papermakers. He further claims that Lord Beaverbrook's "drive" will probably augment this "defertilising flow of straw from farm to paper factory." Further, he states that "in view of the admitted lack of humus in Britain's arable soils, and the limited availability of potash (normally provided in large measure by stock-trodden straw) . . . this process would appear . . . sadly shortsighted." He asks whether the Minister of Agriculture has not something to say on the subject. It would seem that yet another opportunity is presented here to the supporters of chemical fertilising methods to come forward and substantiate their claims, and to show that artificial manures can, if properly employed, perform the rôle of the "missing" humus. Since the above was written, another letter has appeared in *The Times*, this time from the Duke of Norfolk, presenting the official case of the Ministry of Agriculture. He points out that the papermakers' requirements of straw amount to only 5 per cent. of the total production, and that special care has been taken to ensure that they confine their purchases to the less valuable wheat and barley straw, leaving the oat straw to the farmers. We gladly take this opportunity of crediting a Government department with foresight and intelligence.

Wholesale Prices in October

WHOLESALE prices, as measured by the Board of Trade index number, showed a rise of 0.2 per cent. in October as compared with September. Food prices rose by 0.4 per cent. and those of industrial materials and manufactures by 0.2 per cent. The figure for the non-ferrous metals group remained at 123.7 (1930 = 100); chemicals and oils increased slightly from 128.3 in September to 128.5 in October; while the iron and steel group showed a rise from 181.2 to 181.5. These figures represent an increase of 0.2 per cent. in the prices of chemicals and oils for September, 1941, and .6 per cent. on the year. Figures for the other groups are, iron and steel, 0.2 per cent. (11 per cent. for the year), while no appreciable change is recorded for non-ferrous metals. These have a remarkably steady appearance with an increase for the year of 0.2 per cent. only. Among industrial materials and manufactures, group movements were all less than 0.5 per cent., the largest price changes for individual commodities being an increase of 10 per cent. for imported hides (Americanos) and a decrease of 5 per cent. for jute. The small increases of a few chemicals and paint ranged from 0.5 per cent. to 3.5 per cent. The price of chalk lime, however, increased by 5.5 per cent., but this commodity has a weight of only one-half the weighted average taken for the purposes of the index. The aggregate increase since the outbreak of war for industrial materials and manufactures is 55 per cent., and although the weekly movements in this section are insignificant, they continue the upward trend.

OIL FROM SAND

The United States is supplying Canada with machinery for extracting oil from sand situated in large fields 300 miles north of Edmonton, Alberta. The sand oil, which is not found in sufficient quantities to flow, forms a skin round the individual sand particles. Warm water and abrasion break the film off the sand, after which it is a simple matter to separate the oil and water. The Alberta oil-sand beds vary from a few feet to 225 feet thick. Their oil content is sometimes as high as 25 per cent. by weight. With the area of the beds estimated at between 10,000 and 50,000 square miles, Dominion experts believe the sand beds to be capable of yielding 100 billion barrels of oil. The U.S. Bureau of Mines is of the opinion that the field carries about 250 billion barrels.

(*Contents appears on p.* iv)

LIQUID PITCH*

Its Properties and Treatment as Industrial Fuel

PROPERTIES of liquid pitch as an industrial fuel were discussed by Mr. E. Brett Davies at a meeting of the Institute of Fuel held in London on October 30. An examination of the physical and chemical data revealed that normal medium soft pitch has a softening point of 70° C., a calorific value of 16,250 B.Th.U. per lb., and a specific heat of 0.34 to 0.4, approximately, this low value being accounted for by the fact that pitch contains free carbon up to 25 per cent.

Transport

The transport of medium soft pitch in lump form presents no problems other than those experienced in the handling of other bulk solid fuels such as coal. In warm weather it is possible that the pressure faces between fragments of pitch may adhere, but in such circumstances the insertion of a lever in the interstices is sufficient to cause the masses to break apart. Pitch fuel is often transported as a hot liquid in insulated tank waggons. A suitably lagged five-ton tank load of pitch when loaded at 200° C. will not lose more than 2° per hour and will thus remain pumpable for at least 24 hours. In arranging pitch fuel supplies it is advisable to examine the possibility of liquid deliveries since, if these are feasible, "getting" costs are obviated at the tar distillery and melting costs at the consumer's works are reduced to much less expensive heat boosting arrangements. On the other hand, to be entirely dependent upon liquid pitch deliveries restricts storage capacity and places the consumer at the mercy of road transport, and there may be times when such supplies are not available because of other business. The most practical arrangement is undoubtedly to arrange the consuming plant so that liquid deliveries may be received, but to include melting facilities for stand-by, make-up, and similar contingencies.

Pitch Melting

At a works where steam is available at an adequate pressure, this medium forms the most convenient means of pitch melting. The optimum temperature for the atomisation of pitch for combustion is 200° C. (392° F.), and since steam temperature varies with pressure and is not commonly available at pressures equivalent to 200° C., boosting of temperature either by electrical or other methods after melting by steam will usually be found necessary. The actual design of the steam-tube melter depends largely on the materials at hand. Figs. 1 and 2 show a simple shape of tube element mounted in a rectangular tank, while Fig. 3 shows a vertical section through a cylindrical thimble-tube melter. The design of the thimble-tube melter is particularly neat and has proved satisfactory in service. A number of tube elements, depending on the capacity of the melter, are set in the form of a close grid upon which the pitch melts and through which the pitch must flow to reach the outlet. It would be advisable

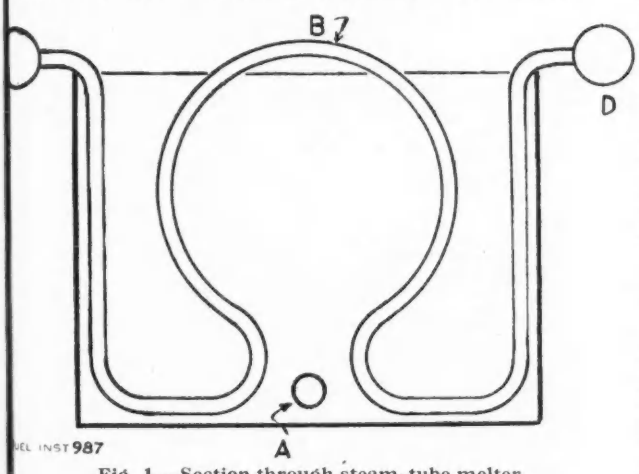

Fig. 1.—Section through steam-tube melter.
A—Pitch outlet. C—Steam inlet.
B—Standard "expansion loop." D—Steam outlet to trap.

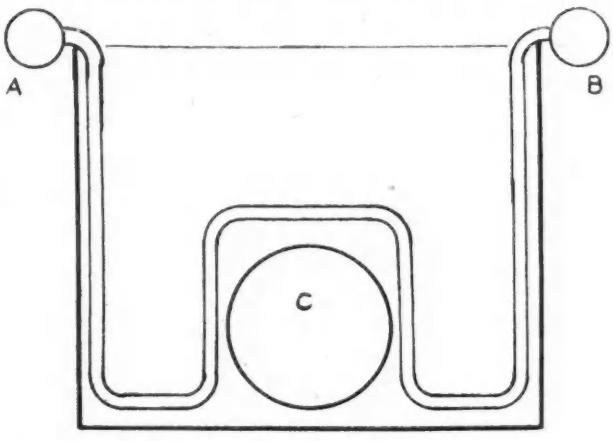

Fig. 2.—Section through steam-tube melter having included an electrical flow heater which should be thermostatically controlled.
A—Steam inlet. C—Cylindrical outflow heater electrically operated.
B—Steam outlet to trap. and thermostatically controlled at 200° C.

with this construction to brace the loops across the neck to prevent side thrust. If this melter is used as a circulating tank the pitch return should be brought within the loop at the opposite end of the tank to the outlet. Melters shown in Figs 1 and 2 are simply constructed, and since the elements may be lifted out of the tank in one piece, cleaning-out operations are simplified. It will be noticed that in each case the hot elements break the pitch surface; this is a good point, and prevents frothing due to moisture if the solid fuel is handled in wet weather.

In general, melters should be so constructed and tubes spaced that it is not possible for the pitch in either a solid or a plastic state to short-circuit the heating element and pass to the outlet, thereby causing blockages. All melters should be adequately lagged. All tubes submerged in pitch should have welded joints.

As an alternative to using works steam, the type of closed coil steam melter shown in Fig. 4 may be used. This melter consists of a melting tank A, which is thoroughly insulated against heat losses and which contains a bank of steel tube loops B. Each of these loops is made from special section steel tubing of $\frac{11}{16}$ in. external diameter, and is closed by a special coupling C. Before closing each loop is partially filled with water, and tested to withstand a pressure of 5 tons diagonal sq. in. Each loop forms a self-contained boiler and steam circuit and is graded to its lowest point which passes through the furnace D, which may be fired with coke or any other convenient fuel. Pressure gauges are mounted on a number of the loops and may be calibrated to indicate temperature. A normal working pressure when melting pitch is 1500 lb./sq. in. In order to ensure effective circulation within these loops, a cold leg E is provided which is exposed to atmosphere. Unless it is desired to work this plant at a high capacity it would be unnecessary in most instances to use further heat boosting since an outlet temperature of 200° C. is

* From a paper delivered by E. Brett Davies before the Institute of Fuel on October 30, 1941.

quite within the range of the apparatus. The outstanding advantage of this type of melter is its complete portability, and provided that a supply of fuel for heating the

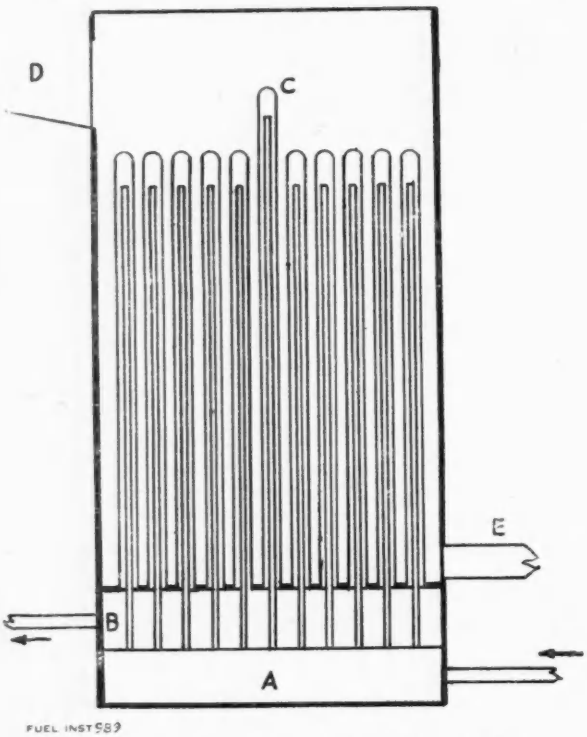

Fig. 3—Section through cylindrical thimble-tube melter.

Steam enters chest A and passes upwards through narrow bore tubes, expands into thimble-tubes and returns to steam chest B, from which it exhausts to a trap.
C is an elongated tube breaking the liquid surface to prevent frothing.
D and E are respectively solid pitch inlet and liquid pitch outlet.

tube furnace is available, then the melter is independent of other works services.

A third type of melter uses the circulation of hot oil through coils contained in a melting tank as a means of heat transfer. The oil, which is a special grade of mineral oil capable of withstanding high temperatures without cracking, is heated in a small boiler arrangement fired preferably with liquid fuel or gas in order that the fuel consumption may be thermostatically controlled. The hot oil is circulated by pump through the melter coils and can also be used while on circuit for the heating of cocks and the jacketing of pitch-carrying mains. Heat transfer coefficients for this type of melter as high as 20 B.Th.U./sq. ft./° F./hour have been achieved. The hot oil melter has the advantage of great controllability and, like the closed coil melter, it is transportable. Disadvantages are high initial cost and complicated construction.

Electrical melting units have also been designed having the requisite low wattage to prevent overheating and carbonisation of the pitch. Electrical heating, moreover, is capable of the closest thermostatic control and should, therefore, be admirable for this purpose. Unfortunately, however, electricity as a bulk heating medium is comparatively expensive, and an electrical consumption of the order of 100 units per ton is not always commensurate with the advantages to be gained from the use of electrically melted pitch fuel even if the power lines to the consumer's works are capable of handling the additional load. None the less, the possibilities of electrical melting should not be overlooked when pitch-melting plant is contemplated.

In many instances, either to supplement works steam melters or for topping up the temperature of liquid pitch deliveries, the most convenient type of booster is the electrical flow heater. These heaters are usually thermostatically controlled, and several makes are available in all capacities for the purpose of raising the fuel temperature to 200° C. before it passes to the ring main. Heaters should be so placed that they are never empty, and in such a position that the elements are withdrawable for replacement. A very sound plan is to arrange a small neon lamp indicator to show when the heater is in operation.

Storage

In general, it is not advisable to carry large stocks of liquid pitch at elevated temperatures, *i.e.*, 200° C., and if it is not desired to work a melter continuously as part of the circuit, a system should be adopted which employs a buffer tank in which pitch stocks are carried at, say, 150° C., with either steam or electrical heating to cover radiation losses. Such a system is admirable for employing melted solid pitch stock in conjunction with liquid deliveries.

Purely as an emergency measure the provision of direct gas firing is used in several supply systems. Care should be taken that this is truly treated as an emergency or, at best, a temporary measure, since, as already noted, the prolonged heating of pitch under static conditions by direct flame may easily lead to coking and unpleasant cleaning-out troubles.

Feed Systems

When comparatively few burners are placed in close proximity to the fuel supply, gravity feed lines have been found quite adequate. For all other purposes the ring main system has been found superior. When using either of these systems, provision must be made for heating up the pitch line prior to passing the fuel, but once having established a free flow, unless the line heating medium is at a temperature higher than the pitch fuel temperature, it is a disadvantage that such "heating" should be continued, and the pitch flow is quite adequate to maintain temperature. As a method of heating fuel lines, a simple and common practice is to clip a half-inch steam line in metallic contact with the pitch line and lag the two together. As an alternative to this "tracer" line method, the pitch line may be concentrically steam-jacketed, but this latter is an expensive and tedious process, and, except for exposed lengths of line, which might be liable to freeze, and for short lengths from mains to burners, need not be practised.

With all pitch lines, a line speed of between 30 ft. and 60 ft. per min. should be arranged, and in the case of ring

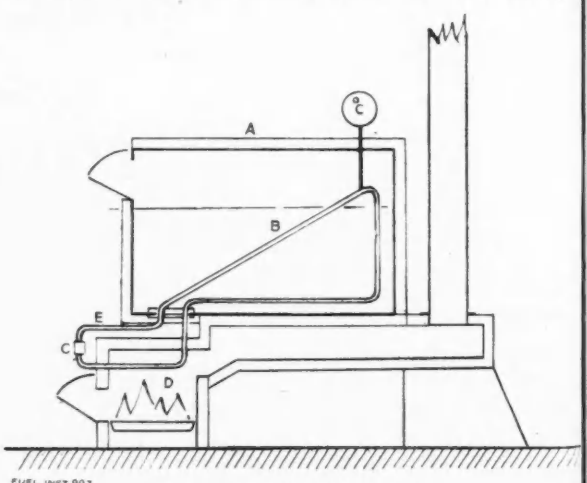

Fig. 4.—Closed coil melter.

mains at least 2½ times the fuel consumption should be circulated. The pressure of the fuel at the burner should not exceed 15 lb./sq. in. This pressure has no function in

so far as atomising at the burner is concerned, and merely ensures a uniform feed.

Valves, Cocks, and Pumping Arrangements

It is common practice to place a cock at the outlet from pitch storage tanks as a means of turning the supply either fully on or fully off. Such cocks are normal cast-iron plug cocks and are obtainable with a steam jacket as an integral part of the casting. For tapping off from pitch mains to burners, the "T" type of valve (Fig. 5) is admirable. This valve is ported to permit a solid flow rather than a thin lengthy stream, and it also has the advantage of being directly in the fuel stream and does not readily "make up." Furthermore, the "T" valve does not create a pocket when closed, in which the pitch could solidify.

As a general practice the tar distiller has always handled hot liquid pitch with a steam-jacketed ram pump. For the purpose of actuating a ring main this type of pump serves quite well and may be placed with a drowned suction. It is very necessary when using this type of pump for fuel work that the air-balancing vessel should be correctly used to prevent uneven fuel pressure from causing the flame length to advance and recede in sympathy with the stroke of the pump. On pitch work it is generally found necessary to drain the air-balancing vessel at least once in eight hours. As an alternative, a small steam pressure may be connected to the top of the air-balancing vessel and the pump stroke balanced against a pressure of about 15 lb. of steam. This practice frequently works quite well, but care must be exercised, since on a number of occasions the steam has been known to blow out the pitch lines by reason of excessive steam pressure.

An interesting alternative to the ram pump is the rotary gear displacement pump which may be totally submerged in the liquid fuel. This type of pump is usually driven by a small-h.p. electric motor mounted with its axis

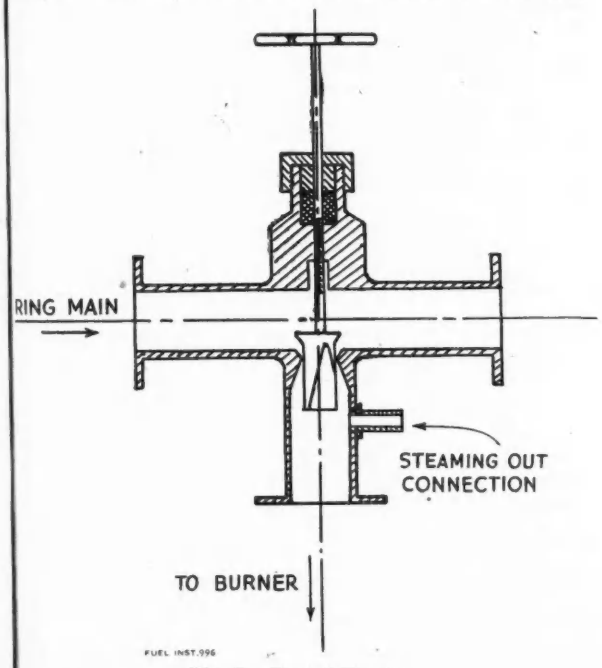

Fig. 5.—Ported T-valve.

vertical on the top of the fuel tank. By virtue of its total submersion the pump obviously requires no heating, and leaking glands and lubricating troubles are absent.

The atomisation of pitch and its injection into the furnace are generally accomplished by a burner of the high-pressure steam type using at least 50 lb. steam pressure as the atomising medium, though on occasion hot compressed air has been used in place of steam.

The possibility of using as alternatives the pressure jet atomising system or the low-pressure air system has been discussed from time to time, and while in the opinion of the writer the former is ruled out on the score of nozzle carbonisation and the high pitch temperature necessary to

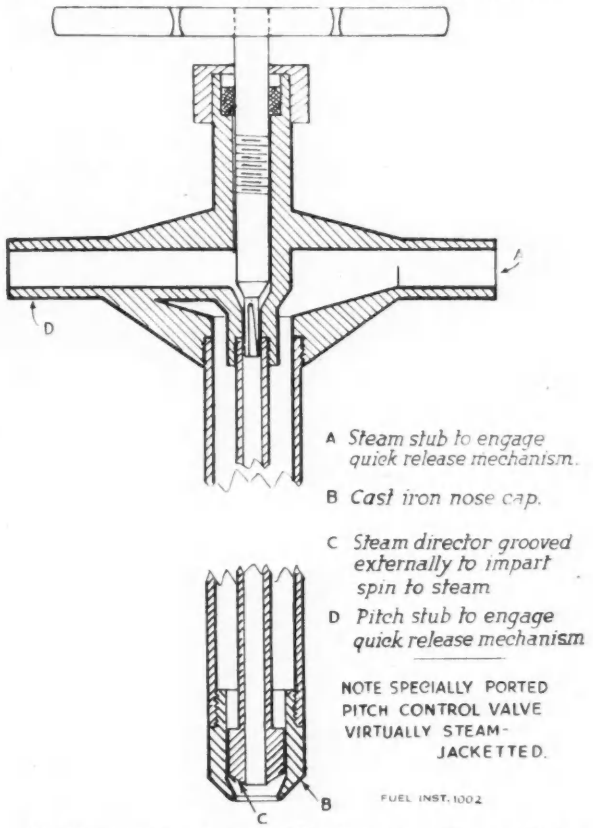
D
A Steam stub to engage quick release mechanism.
B Cast iron nose cap.
C Steam director grooved externally to impart spin to steam
D Pitch stub to engage quick release mechanism
NOTE SPECIALLY PORTED PITCH CONTROL VALVE VIRTUALLY STEAM-JACKETTED.
C
B
FUEL INST.1002

Fig. 6.—Section of a typical high-pressure burner head and nose.

achieve the required fluidity, the latter method has not been adopted chiefly because of the difficulty of preheating large volumes of air to 200° C.

The apparent simplicity of the pitch burner has frequently led fuel consumers to design and to manufacture their own burners. Unless this is expertly executed, poor atomisation and high steam consumptions are likely to occur which may lead to dangerous repercussions. Good oil and liquid fuel burners are the result of considerable thought and research; and while their refinements and carefully calculated proportions may not be at once evident, the ordinary burner user is well advised to purchase a proprietary burner, even at additional cost, rather than to experiment in making his own.

The immediate effect of poor atomisation is that the larger particles have an appreciable kinetic energy, and can therefore traverse greater distances within the furnace before they are consumed. With the home-made burner the injector effect of high steam consumption can further aggravate this fault, and excessive flame lengths, lack of stability, and carbon deposition around ports and on furnace walls are generally symptoms of poor burner performance. Even with a well designed burner poor atomisation and its concomitant troubles can occur if the fuel temperature is not high enough to give the necessary low viscosity for atomisation.

Many modern burner sets incorporate a quick release mechanism whereby the burner may be changed in a matter of seconds. This is a very desirable feature, and the practice of carrying a spare burner to permit the burners in commission to be changed and cleaned once per shift is to be recommended.

LETTER TO THE EDITOR

Recovery of Used Lubricating Oil

SIR,—I have read with interest the letter recently published in THE CHEMICAL AGE from Mr. Soulal, on the subject of waste-oil recovery, and I am very glad of this opportunity of replying.

First, the question of the extra cost involved in clay-treating at high temperatures, *e.g.*, 250°-300° C., depends entirely on the purpose for which the recovered oil is required. If for re-sale, then the extra expense is certainly justifiable. In fact, it is due to the attempted marketing of badly recovered oils that we owe present-day prejudice against these products.

Regarding high-temperature filtration, I am afraid I omitted to stress the fact that this leads to a brighter finished product. Oils filtered at temperatures below 110° C. frequently turn cloudy on storage. Precautions can be taken to prevent oxidation of the oil by installing a cooler after the filter-press, and suitable filter-cloths must be chosen.

On the question of acidity, we have in the recovery of waste oil, both types, *viz.*, organic and inorganic, with which to deal. If necessary, the first can be removed by an alkali wash as the first step in the treatment of the oil, and the second is eliminated by the use of a good-quality activated earth. Oils so treated should certainly be up to normal specification figures, and no further refining should be necessary.

Regarding the samples used for my experimental work, the whole of the results given are based on the one used oil. An examination of the figures obtained on analysing this oil will show, I think, that it is a fair average sample of crankcase drainings.

Since the publication of my article, it has occurred to me that the dilution figures of the various oils might be of some interest. The used oil itself had a dilution (A.S.T.M.) of 11.1 per cent., and the recovered oils, 1, 2, 3, 5, and 6 had figures of 9.7 per cent.; 8.8 per cent.; 3.4 per cent.; nil; and nil respectively.

Finally, we have the problem of the disposal of acid-sludge, and I am in complete agreement with Mr. Soulal that it is a difficult proposition, and can be decidedly expensive. However, it is a problem that has faced oil-refiners ever since sulphuric acid was used as a refining medium, and it has been partially overcome in many ways. Therefore I do not think that this problem alone should prevent the effective recovery of waste oil. A most interesting field of research is open in attempting to find a useful application for acid-sludge.—Yours faithfully,

J. E. WALKER.

November 18, 1941.

Chemistry of the Edison Cell

Change of KOH Concentration

THE charging of the positive electrode of an Edison cell is usually represented by an equation like $2Ni(OH)_2 + 2OH' = Ni_2O_3,1.2H_2O + 1.8\ H_2O + 2$ electrons or $2Ni(OH)_2,2H_2O + 2OH' = Ni_2O_3,3H_2O + 2H_2O + 2$ electrons. Either of these equations requires a dilution of the electrolyte (a caustic potash solution) during charging and an increase of its concentration during discharge. Ershler, Tyurikov, and Smirnova (*J. Phys. Chem. Russ.*, 1940, *14*, 985), in agreement with earlier investigators, find the alkalinity of the KOH solution decreasing at charge and increasing at discharge. But the change of the KOH concentration depends on the concentration itself; when the KOH solution was N1.5 one faraday of the charging current reduced the alkalinity as though 2.3 to 3.6 moles of water had been added; and in N4.2 KOH the apparent addition of water was 1.1 to 2.1 moles per faraday. These findings suggested that the variation of the KOH concentration was due to sorption of KOH itself and not to an addition of water. Simple experiments showed the truth of this interpretation. When to the KOH solution some potassium carbonate or potassium chloride was added, its concentration slightly increased during charging, evidently because some water was decomposed by the current; at any rate no dilution of the electrolyte could be detected. The nickel oxide electrode takes up some potassium hydroxide when it is oxidised to a compound of the tervalent nickel. As the usual theories of the Edison cell do not account for this sorption they cannot be adequate.

Graphite from American Sources

Overcoming Difficulties of Supply

FLAKE graphite of the type hitherto available only from Madagascar may soon be supplied from American sources, if methods devised by the Bureau of Mines for treating Alabama graphite ores successfully pass practical tests now under trial. Although the total amount of graphite required by U.S. industry each year is not large, lack of it may seriously impede the defence programme. In 1937, 27,700 short tons were used, of which 21,000 tons were amorphous and the remaining 6700 tons crystalline (including flake and also Ceylon lump, chip, and dust graphite). American production of graphite has been confined almost entirely to the cheaper and less pure types such as those used for foundry facings and in the paint industry; present output is limited to a few hundred tons annually, though large deposits occur in the country.

Experiments conducted by the Bureau of Mines at Tuscaloosa, Alabama, in co-operation with the University of Alabama, have resulted in improved methods of treating flake graphite ores, so that from each ton of ore considerably higher yields of the critical type of graphite can be obtained. Among the 22 samples of ore tested a wide variation in the deposits was found. Several of the samples, however, responded readily to the concentrating technique devised, and gave a coarse-flake product containing 85 per cent. or more of carbon with a favourable recovery. Under good milling conditions, a yield of approximately 47 lb. of coarse-flake graphite per ton of ore may be expected from the most promising of the Alabama samples. An additional 40 lb. of small size flake graphite could be recovered as a by-product and might be marketed for other uses. The average for the group of 22 samples, which represent a fairly complete cross-section of the district, was about 33 lb. of coarse flake per ton.

Alsatian Potash Mines

Under German State Management

A NEW company, Elsässische Kaliwerke G.m.b.H., has been formed by Preussag, the company in charge of the mining interests of the Prussian state, for the purpose of managing the potash mines in Alsace. The new company will be entrusted with the administration of the properties of both Ste. Thérèse, the private potash-producing company, and the French Government, but the question of what is to be done with the Alsatian potash mines after the war is not affected by this arrangement. A return of the Alsatian potash mines to the pre-1918 owners is in many cases impossible owing to the great changes that have taken place in the German potash industry since. It would appear that the German Government intends to take an active part in the exploitation of these mines and the chemical works based on them, but the leading German potash producers have also registered claims for the Alsatian properties.

Accounts for 1940 just published by Salzdetfurth, one of the two leading German potash combines, show that sales in the home and export markets were increased. Plant extensions were carried out especially for certain by-products (bromine), but the surplus is mainly used to finance unprofitable engagements in other fields. Salzdetfurth is responsible for the German copper production which requires substantial subsidies, while the other big potash combine, Wintershall, plays a similar part in the oil and also in the magnesium industry.

Plastics in the Cable Industry

Possible Substitutes as Dielectrics

DISCUSSING the subject of cables in his inaugural address as chairman to the Transmission Section of the Institution of Electrical Engineers in London on November 12, Mr. S. W. Melsom said that perhaps the most important thing on the horizon was the development of the great plastics industry and the possible application of plastic materials to cables. This development was due entirely to the chemist, and when time permitted this work to be seen in its proper perspective, it would be found to represent one of the greatest achievements of the age. Solid plastic materials of all kinds were almost commonplace, but not so well known was the intensive work directed towards producing materials superior in their intrinsic properties to any of the older known materials for special purposes. Glass-like materials suitable even for lenses were in use, though clearly susceptible of greater development, and a later and particularly significant production was the thread or wire of plastic material having a higher tensile strength than steel, with a specific gravity of the order of one-fifth of the latter.

For cable dielectrics the problem was not so simple, since the materials used must be, and remain, thermoplastic, a quality that usually required the incorporation of a plasticiser with the base material, which plasticiser very largely governed the properties of the material. In view of the extraordinarily high qualities of the present materials in use in the cable industry, namely rubber and paper, the industry, naturally, could not turn over to any new material without the fullest assurance of at least as good service, with economic advantage.

Qualities of Rubber Substitutes

At present there were at least four distinct groups of plastic materials of differing composition, each group containing a number of grades, which were under consideration for cable use, mainly as substitutes for rubber cables. These materials had a wide range of properties, and although, over all, it could not be said that they were even the equal of vulcanised rubber, many of them were unaffected by oxygen and some of the reagents inimical to rubber. Polyvinyl chloride compound was now being used for these extreme conditions of use and was proving satisfactory both as an insulation and as a protective sheath over the vulcanised rubber insulated core. Actually, the insulating properties of this plastic material could be described as only moderate, but it was unaffected by oxygen, oil, acid, etc., was resistant to flame or fire, and, so far as ordinary conditions were concerned, might be termed indestructible.

Development was proceeding at a great rate particularly now that cable technicians were working in close association with plastics chemists, and it was reasonably certain that in a few years plastics would play an important part in the rubber cable industry. At the same time, rubber chemists had by no means finished with rubber, and he ventured to say that apparently parallel paths of rubber and plastics chemistry would eventually be found to converge, with great benefit to both. There was some evidence that a mixture of rubber and high-grade plastic material produced a very good result indeed, and we should not overlook many high-grade materials such as polythene and styrene. The mixture material, however, led to some conjecture as to the ultimate base material. It was at least as likely that the material of the future would start life as a natural rubber processed to the form of a plastic or even of a rubber compound, and improved thereby, as that its base would be coal, carbide, or oil.

Difficulty of Replacing Paper

As for the prospects of plastics in the impregnated paper cable field, it was difficult at the moment to visualise anything taking the place of paper for low-pressure cables, on economic grounds. The position was nearly as difficult for high-pressure cables, although a plastic material was being used as a constituent in one development of a gas type of cable, and styrene had been developed for super-tension joints.

As for synthetic rubbers, it had still to be proved that, over all, their qualities were superior or even equal to those of vulcanised rubber. Apart from some minor uses of special materials classed as synthetic rubbers—but not comparable with rubber in their mechanical or electrical properties—there was little sign at the moment of a synthetic rubber which would replace natural rubber. It had not yet been possible to have such full scale experience in this country as in Germany and elsewhere, and the latest information on the question of cost indicated that it was at least three times as high as that of natural rubber, with considerable doubt as to correspondingly better performance. The outstanding point which had been somewhat missed in all discussions on synthetic rubber was that the raw rubber chemist was equally hard at work effecting improvements in his own products.

Fuel for Producer Gas

Committee to Examine Sources of Supply

THE Secretary for Mines has invited the committee which, under the chairmanship of Lord Henley, considered low-temperature carbonisation processes last year, to reassemble. He has asked it to examine the sources of fuel for producer-gas vehicles, to estimate the quantities that could be made available at present, and to report on the measures that would be required to increase the supplies if necessary. The committee will also inquire into the development of the country's peat resources as an additional domestic fuel.

THE CHEMICAL AGE understands that the constitution of the committee is as follows:—Lord Henley (chairman); Mr. Gordon Macdonald, M.P.; Dr. W. H. Mills, Professor of Stereochemistry in the University of Cambridge and President of the Chemical Society; Mr. F. B. Richards, chairman of the Woodall-Duckham Company; Mr. J. Shearman, road motor engineer, L.M.S. Railway; Mr. T. E. B. Young, general manager, Bolsover Colliery Company; Mr. W. A. Macfarlane (secretary); and Dr. F. S. Sinnatt, Director of Fuel Research (Department of Scientific and Industrial Research), and Mr. J. A. Brook, Mines Department, assessors. Mr. Shearman takes the place of Mr. W. E. Mortimer in the original committee and Mr. Brook serves as an additional assessor.

Chemical Trading Groups

Registration Scheme by the B.C. and D.T.A.

THE British Chemical and Dyestuffs Traders' Association has established Groups representing various classes of chemicals, and traders have been asked to indicate the Group or Groups in which they desire to be registered. This step has been taken to facilitate the work of the Association in dealing with the many questions now arising.

The Groups are: (i) pigments, colours, minerals, and extenders; (ii) drugs and pharmaceuticals; (iii) wood distillates and allied synthetic products; (iv) methylene chloride and hydrocarbon compounds; (v) coal tar products, including benzol, toluol, phenol, xylol, etc.; (vi) heavy chemicals not otherwise specified; (vii) fine chemicals not otherwise specified.

Personal Notes

MR. P. PRITCHARD, M.Inst.A.E., of Birmid Industries, was elected President of the British Cast Iron Research Association (in succession to the late Lord Austin) at Birmingham on Thursday last week.

MAJOR ANDREW HOLT, a Canadian, who was formerly in charge of transport at the Ministry of Aircraft Production, has been appointed adviser on scrap supply to the Ministry of Supply.

DR. D. H. DAKIN has been awarded the Davy Medal by the President and Council of the Royal Society, for pioneer work in biochemical research, especially for fundamental contributions to the study of intermediate metabolism.

DR. ELMER K. BOLTON, chemical director of E. I. du Pont de Nemours & Co: since 1930, has been awarded the Chemical Industry Medal of the Society of Chemical Industry. The presentation was made on November 7 at a joint meeting of the American Section of the Society of Chemical Industry, and the New York Sections of the American Chemical Society and the American Institute of Chemical Engineers. Dr. Bolton has been intimately associated with the research leading to the development of neoprene and nylon, and was instrumental in initiating the research in the Du Pont Company of synthetic rubber.

Obituary

MR. JAMES FERGUSON, who died on November 7 at the age of 75, was chairman and founder of James Ferguson & Sons, Ltd., synthetic resin and ebonite manufacturers. He was also chairman of the Cornbrook Chemical Co., colour manufacturers, of Stockport.

DR. THOMAS R. DUGGAN, Ph.D., F.I.C., whose death at South Norwood, at the age of 84, is reported, was a founder member of the Society of Chemical Industry. He began his chemical career under Professor H. E. Armstrong at Finsbury, and then proceeded to King's College, London. After employment with a firm of paint manufacturers until 1898, he practised for 12 years as a chemical engineer. Afterwards he became Technical Manager with the Permutit Co. in the United States, and in 1929, on his retirement, returned to his native country.

New Control Orders

Maximum Prices for Sulphur

THE Minister of Supply has issued the Control of Sulphur (No. 1) Order, 1941 (S.R. and O. 1941, No. 1798) fixing maximum prices for sulphur ground from crude sulphur. The Order covers all sales of not less than 2 cwt. gross weight. Copies of the Order, which came into force on November 18, 1941, may be obtained (price 1d.) from H.M. Stationery Office, or through any bookseller.

Control of Bichromates

The Control of Bichromates (No. 1) Order (S.R. & O. 1941, No. 1818), controlling the price of commercial-grade sodium and potassium bichromate in quantities less than 1 cwt., which came into force on November 19, is now available at H.M. Stationery Office, price 1d.

Fuel and Power Controllers

Regional Appointments Announced

THE President of the Board of Trade has appointed regional fuel and power controllers in the Civil Defence Regions to co-ordinate the activities of the departments concerned in respect of coal, gas, electricity, and oil, and, in emergency conditions, to take charge of these interests under the Regional Commissioner. The day-to-day administration of these departments in the regions will continue as at present, and these appointments will not affect the work or position of the Board of Trade representatives on the Production Executive's Regional Boards.

The appointments in the regions are as follows:—Scottish, Sir Nigel Campbell; Northern, Mr. Clive Cookson; North-Western, Lord Crawford; North-Eastern, Dr. H. S. Houldsworth; North Midland, Sir William Firth; Midland, Sir Bernard Docker; Eastern, Mr. H. H. Holmes; Welsh, Mr. E. L. Hann; Southern, Colonel H. W. Woodall; London and South-Eastern, Colonel J. C. Dalton; South-Western, to be announced later.

British Chemical Prices

Market Reports

REPORTS from most sections of the general chemicals market indicate a strong price position and quotations, almost without exception, display a firm undertone. Contract deliveries are proceeding satisfactorily, although for many items new spot business is difficult to negotiate. A routine trade is passing in the potash and soda sections with a number of products continuing to be supplied on a rationed basis. Formaldehyde continues to be firm in quotation with supplies a little easier. Ammonium chloride is steady, and both red and white lead are unchanged on a firm demand. Conditions in the market for coal tar products may be characterised as tight, supplies of most items being already booked for some time ahead for essential purposes. Creosote oil is firm on a fairly substantial turnover, while there is a brisk demand for both cresylic acid and carbolic acid crystals. Offers of both the toluols and the xylols are quickly absorbed. Quotations for naphthalene are now controlled and supplies are being earmarked for priority needs.

MANCHESTER.—Although virtually all sections of the Manchester chemical market remain on a distinctly firm basis, actual changes since last report have been few, though there is a tendency in several directions for values to move still higher. There is a fairly steady call for supplies of chemicals for the textile and allied trades, while in other directions specifications against contracts have been maintained at a good level. Fresh inquiry during the week has been on moderate lines. In the tar products section new business in several sections has been quieter in consequence of further control measures.

GLASGOW.—The position in the Scottish heavy chemical trade is unchanged from last week, home business remaining steady for deliveries ex stock. Forward position is slow. Export inquiries are rather limited. Prices remain unchanged.

Price Changes

Ammonia Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Antimony Oxide.—£95 to £110 per ton, nominal.

Antimony Sulphide.—Golden, 1s. 2d. to 2s. per lb. Crimson, 2s. 2d. to 2s. 7d. per lb.

Cadmium Sulphide.—5s. 9d. to 6s. 6d. per lb.

Carbon Bisulphide.—£35 5s. to £40 5s. per ton, according to quantity, in free returnable drums.

Chlorine, Liquid.—£22 7s. 6d. per ton, d/d in 16/17 cwt. drums (3-drum lots); 5½d. per lb., d/d station in single 70-lb. cylinders.

Citric Acid.—1s. 10d. per lb.

Cream of Tartar.—100%, £13 2s. per cwt., less 2½%, d/d in sellers' returnable casks.

Glycerine.—Chemically pure, double distilled 1260 s.g., in tins, £3 15s. to £4 15s. per cwt., according to quantity; in drums, £3 9s. 6d. to £4 1s. Refined straw industrial, 5s. per cwt. less than chemically pure.

India Rubber Substitutes.—White, 6 1/16d. to 9½d. per lb.; dark, 5¾d. to 6¾d. per lb.

Lactic Acid.—Dark tech., 50% by vol., £40 10s. per ton. Not less than 1-ton lots ex works; barrels returnable, carriage paid.

Mineral Black.—£7 10s. to £10 per ton.

Naphtha.—Solvent, 90/160, 2s. 6d. to 2s. 10d. per gal.; heavy, 90/190, 1s. 11d. naked at works. MANCHESTER: 90/160, 2s. 6d. to 2s. 10d.

Naphthalene.—Crude, whizzed or hot pressed, £11 3s. to £11 8s. per ton; purified crystals, £19 to £36 per ton, in 2-cwt. bags; flaked, £25 to £38 per ton. MANCHESTER: Refined, £19 to £38 per ton.

Potassium Bichromate.—Crystals and granular, 7½d. per lb.; ground, 8½d. per lb, for not less than 6 cwt.; 1-cwt. to 6-cwt. lots, ½d. per lb. extra (maximum prices).

Potassium Chlorate.—Imported powder and crystals, ex store London, 2s. per lb., nominal.

Tartaric Acid.—4s. 0½d. per lb., less 5%, carriage paid for lots of 5 cwt. and upwards.

Vegetable Lamp Black.—£49 per ton.

The Export of Goods (Control) (No. 39) Order, 1941, which consolidates previous Export Control Orders, comes into force on December 1 and sets out the position at that date.

General News——From Week to Week

The address of the London offices of the Imperial College of Tropical Agriculture, from November 19, is: Grand Buildings, Trafalgar Square, London, W.C.2.

Monthly schedules containing an up-to-date list of all commodities subject to export control in the U.S., together with general information regarding export control, can be seen by persons interested on application to the Department of Overseas Trade, Neville House, Page Street, London, S.W.1.

Deodorants, which for this purpose are defined as being clear liquid preparations containing an aluminium salt in solution, prepared and sold solely for use for personal hygiene, may, under a General Licence (S.R. and O. 1941, No. 1807), be supplied outside quota by registered manufacturers who hold a Board of Trade nucleus certificate.

The Thermal Syndicate, Ltd., Wallsend, Northumberland, report that they can now supply alumina cement for insulating and securing electric heating elements of nickel chromium alloy, wound on Vitreosil furnace linings. The cement has been used regularly in their own laboratory and tested outside with satisfactory results.

Among the 610 additions to the list of traders in neutral countries with whom trading is unlawful, contained in the Trading with the Enemy (Specified Persons) (Amendment) (No. 18) Order, 1941, are the names of 15 firms of chemical interest in Latin America and Sweden. Their names and addresses will be provided on request.

George Cohen, Sons and Co., Ltd., of Wood Lane, London, have acquired the whole of the machinery and plant of Beach Tin Operating Co. (Gwythian), Ltd., near Hayle, Cornwall. The plant includes a Hardinge ball mill, tube mills by Fraser and Chalmers and by Cyanide Plant Supply Co., 10 ft. by 5 ft. classifiers, sand tables, etc., and an aerial ropeway 1400 yards long. A complete list of the equipment will be sent on application to Messrs. Cohen.

In order to further co-operation in the pharmaceutical and allied industries by the pooling of knowledge, discoveries, and manufacturing and other facilities, the Therapeutic Research Corporation of Great Britain, a private limited company with a capital of £500,000, has been established with a registered office at 183 Euston Road, London, N.W.1. Any useful information acquired by the Corporation will be made available to Government, municipal, medical, and similar authorities. The right to appoint one director each is in the hands of Boots Pure Drug Co., Ltd., British Drug Houses, Ltd., Glaxo Laboratories, Ltd., May and Baker, Ltd., and the Wellcome Foundation, Ltd.

Foreign News

Imports of chemicals, drugs, dyes and colours into Palestine for the first five months of 1941 totalled £P253,214, against £P260,280 in the corresponding period of 1940.

United States production of copper was 80,043 short tons in July, a decrease of 2.8 per cent., from that of June; a further decrease to 79,300 tons is expected for August. Production for the first seven months of 1941 totalled 558,860 tons.

Increased production of calcium cyanamide to meet enlarged demands for nitrogenous fertilisers in Sweden is projected by the Stockholms Superfosfatfabrik, the only Swedish producer of this chemical. Output is scheduled at 40,000 metric tons, 10,000 more than the present capacity.

Mercury production from United States mines dropped to 3400 flasks in July from 4000 flasks in June, but rose in August to 4100. Consumption declined from 3300 flasks in June to 3200 in July, and also went up in August to 3600. Prices for mercury at the beginning of July ranged from $185 to $188 a flask and closed at the end of August at $192 a flask.

According to a report from Lisbon, during a recent raid by the R.A.F. a chemical factory at Tessenderloo (Belgium), was destroyed. In all probability, this refers to the Produits Chimiques de Tessenderloo S.A., a well-known industrial chemical company, which manufactures caustic potash, sulphates, phosphates, sulphuric and hydrochloric acid, chlorine and chlorides, etc.

Nickel shortage has compelled the Germans to remove all five-franc nickel coins from circulation in occupied Belgium as from July 1. According to *La Libre Belgique,* 6,000,000 only have been collected out of 200,000,000 in circulation.

Lead production in the U.S. for July was 36,867 short tons, a decline of 3 per cent. from that of June. Preliminary reports indicate that the output of lead in August was 37,000 short tons. Totalled production up to July was 265,345 short tons.

All stocks of magnesium in the United States have been impounded by the Office of Production Management to be used in the production of aircraft and incendiary bombs, says British United Press.

Total imports of sulphur into Mexico have declined from 10,012 long tons in 1937, to 5342 in 1939 and 4820 in 1940. Formerly, large amounts of sulphur were produced in the country, but the type of sulphur now used in international commerce is of such high grade that it is difficult for the Mexican ores to compete.

Imports into Canada for the first seven months of 1941 were valued at $772,992,000, according to the Dominion Bureau of Statistics, against $585,597,000 for January-July, 1940. Notable rises are to be seen in the imports from the following countries in $000): Brazil, 1842 to 10,091; Colombia,4599 to 7239; Egypt, 520 to 1097; Netherlands East Indies, 924 to 2266; Straits Settlements, 12,459 to 17,255; and Venezuela, 1601 to 2661. Total imports in July, 1941, were worth $127,707,000, against $89,496,000 in July, 1940.

Forthcoming Events

Dr. J. C. Drummond, D.Sc., F.I.C., Professor of Biochemistry in the University of London, will speak on "Recent Advances in the Science of Nutrition and their Significance in War-Time," in a series of four lectures, at 2.30 p.m., on **November 25,** and subsequent Tuesdays, at the **Royal Institution,** 21 Albemarle Street, W.1.

The autumn meeting of the **Iron and Steel Institute** will be held at 4 Grosvenor Gardens, London, S.W.1, on **November 25,** at 2.45 p.m., when the following papers will be discussed:—"Apparent Relations between Manganese and Segregation in Steel Ingots," by J. H. Whiteley, "The Application of Spectrographic Methods to the Analysis of Segregates," by F. G. Barker, J. Convey and J. H. Oldfield, and "The Ladle Cooling of Liquid Steel," by T. Land.

The Streatfeild Memorial Lecture will be delivered at the **Institute of Chemistry,** 30 Russell Square, London, W.C.1, on **November 26,** at 2.30 p.m. The subject will be "Precious Metals," and the lecturer, Mr. H. Gordon Dale.

A meeting of the Midlands Centre of the **Electrodepositors' Technical Society** will take place on **November 26,** at 4 p.m., at the James Watt Memorial Institute, Great Charles Street, Birmingham, 3, when Mr. H. Marston will present a paper on "Cadmium Plating and Similar Processes to Meet War-time Needs."

The 24th annual meeting of the **British Association of Chemists** will be held at the Café Royal, Regent Street, London, W.1, on **November 29,** at 3 p.m. The chair will be taken by the President, Professor F. G. Donnan, C.B.E., F.R.S., M.A., F.I.C.

The London Section of the **Society of Chemical Industry** will meet on **December 1,** in the Rooms of the Chemical Society, Burlington House, W.1., at 2.15 p.m., when Dr. T. H. Durrans, D.Sc., F.I.C., will speak on "The Fine Chemical Industry as a Servant of the Community."

A joint meeting of the **Society of Chemical Industry** with the **Society of Public Analysts** will take place on **December 3,** at 11.30 a.m., in the rooms of the Chemical Society, Burlington House, W.1, when four papers dealing with "The Fortification and Enrichment of Human Foods by the Addition of Specific Nutrients" will be delivered.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BRADFORD FERTILISER CO., LTD., Cockermouth. (M., 22/11/41.) October 25, £2000 debenture, to Barclays Nominees (Lombard Street), Ltd.; general charge. *£7000. January 13, 1941.

CHEMICAL ENGINEERING AND WILTON'S PATENT FURNACE CO., LTD., Worthing. (M., 22/11/41.) October 20, £60,000 (not ex.) debenture, to Crédit Lyonnais charged on certain moneys, also general charge (subject &c.). *£4650. December 31, 1938.

J. V. RUSHTON (LONDON), LTD., anodisers. (M., 22/11/41.) October 21, debenture, to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. *£1500. January 14, 1941.

Receiverships

LIVERPOOL PLASTIC CO., LTD. (R., 22/11/41.) W. Davis, of 24b The Temple, Dale Street, Liverpool, appointed Receiver on October 24.

ALEXANDER THOMPSON (METAL WORKERS), LTD., Bolton. (R., 22/11/41.) H. Longrigg, of 1 Dickinson Street West, Manchester, appointed Receiver on October 22.

Satisfaction

THOMAS WEBB & CORBETT, LTD., Stourbridge, glass manufacturers. (M.S., 22/11/41.) Satisfaction, October 29, £205 15s. 6d. part of amount outstanding July 1, 1908.

Company News

British Plaster Board, Ltd., have declared an interim dividend of 10 per cent. (5 per cent.).

Reckitt and Sons have declared a quarterly dividend of 5 per cent. (same).

Manbre and Garton, Ltd., announce a final dividend of 12 per cent. on ordinary shares, making 17 per cent. (18 per cent.).

Chloride Electrical Storage Co., Ltd., have declared an interim dividend of 5 per cent. (same).

National Fertilisers Ltd., have declared a dividend on 4½ per cent. redeemable cumulative preference shares for half-year ending December 31, payable January 1, 1942 (same).

Lewis Berger and Sons, Ltd., have declared a final ordinary dividend of 4½ per cent. (7 per cent.), making a total, for the year ended July 31, of 7 per cent. (13 per cent.).

Chilean Nitrate and Iodine Sales, Ltd., announce a half-yearly interest payment of 2½ per cent. on the 5 per cent. sterling income debentures.

J. Dampney and Co., Ltd., Britannic Works, Newcastle-on-Tyne, have changed the title of the company to **British Paints, Ltd.,** as from November 3, and **British Paints, Ltd.,** of the same address are now known as **British Paints (Holdings), Ltd.**

Avonmouth Farms, Ltd., manufacturers of or dealers in fertilisers and chemical products, etc., have increased their nominal capital beyond the registered capital of £500 by the addition of £24,500, in £1 shares. On October 16, 1941, the National Smelting Company, Ltd., of Bristol, were allotted 21,998 £1 shares for cash, with 2s. per share called up.

New Companies Registered

Industrial Heat Co. (Great Britain), Ltd. (370,561).—Private company. Capital: £1000 in 2000 shares of 10s. each. Manufacturers of and dealers in furnaces for the heat treatment of metals, ovens for tin printing on sheet metal or other materials, furnaces for vitrifying enamels on iron, steel and other metals, and furnaces, boilers and heating apparatus of all kinds; manufacturers of and dealers in tin boxes and canisters, air conditioning plant, equipment for the vitreous enamelling industry, porcelain enamel frits, oxides and other requisites for the porcelain enamel industry, etc. Subscribers: John O'Brien and Mrs. Catherine J. O'Brien, 30 Croftdown Road, Birmingham, 17.

Chemical and Allied Stocks and Shares

THE undertone in most sections of the Stock Exchange been very firm, although there was no appreciable impro ment in the volume of business, sentiment having been gov by uncertainty as to the outlook in the Far East and the lat situation in America. Nevertheless, in the continued ab of selling, prices again responded strongly when impro demand developed, and industrial securities showed numer individual features of interest. There was a firmer trend British Funds. The favourable tendency in leading indust securities should not, of course, be viewed as indicating p bilities of improved dividends. On the contrary, in most ca the market will be quite satisfied if dividends are maintained having regard to the changed conditions resulting from the wa and the weight of taxation. In many instances, yields on th basis of last year's dividends are still not unattractive, and, moreover, where demand has been in evidence despite yields being very moderate, buyers are willing to take a long view in the hope that, after the war, earnings and dividend payments will show good recovery.

The prevailing assumption in the market is that, bearing in mind their vital contribution to the war effort, many companies connected with the chemical and kindred industries should have reasonable prospects of maintaining dividend payments. The view remains current that Imperial Chemical ordinary units are likely to remain on an 8 per cent. dividend basis, and at 33s. 1½d., the yield compares favourably with that on many other leading industrial securities. I.C.I. 7 per cent. preference at 34s. were also well maintained in price as compared wit a week ago. B. Laporte have changed hands at 63s. 1½d. and Fison Packard were around 36s., while elsewhere, Le and Unilever have improved from 27s. to 27s. 6d. Courtau have been prominent with a rise of 2s. to 36s. 6d. on announcement that the price to be paid to the company for former holding of American Viscose Corporation shares is to decided by arbitration. British Plaster Board 5s. ordin shares have also provided a good feature at the time of writ having been marked up sharply to 19s. on the doubling of t interim dividend to 10 per cent., which had not been expec in the market.

Elsewhere, Imperial Smelting remained steady at pending the dividend decision, and Barry and Staines were g with a rise to 38s., awaiting the interim dividend announcem while Nairn and Greenwich were firm at 61s. 3d. Triplex G were again good with a further improvement to 33s. 1½d., a various other shares of glass and kindred companies were inclined to be more active, including United Glass Bottle, Forster's Glass and Key Glassworks. Results of the last-named compa fall to be issued next month. Shares of companies wi interests in plastics also remained rather more active; Erino 5s. ordinary held their improvement and have transferred to 6s. 9d.; awaiting the financial results, British Industri Plastics 2s. shares changed hands around 3s. 4½d.; and Th De La Rue were dealt in up to 46s. 10½d. Elsewhere, Lacrin Products and Catalin shares each transferred around 2s., British Glues showed business at 6s. 6d. at one time. Business at 22s. 6d. was recorded in Monsanto Chemicals 5½ per cent preference shares.

In other directions, Greeff-Chemicals Holdings 5s. ordina have transferred at 5s. 6d., and Lawes Chemical around 8s. 6d., while Blythe Colour were done at 5s. at one time, and British Lead Mills 2s. ordinary around their par value. Goodlas Wall 10s. ordinary have changed hands at 10s. 6d., and the 7 per cent. preference shares at 27s. 9d. Elsewhere, Tub Investments were 86s. 9d., having remained under the influence of the lower dividend, although it is expected that the full result will show that taxation has absorbed a larger sum and the profits are again being dealt with conservatively. Dorman Lo had an easier appearance at 21s., awaiting the dividend a nouncement, but Richard Thomas ordinary and preference m better prices. United Molasses improved further to 29s. 7½d and the units of the Distillers Co. moved up sharply to 71s. on the assumption in the market that the plaster board other subsidiary interests of the company may be doing w Boots Drug were better at 35s. 6d. Oil shares were dull, de satisfaction with the Anglo-Iranian results.

Oberschlesische Stickstoffwerke A.G., a company which was formed by the Reich-owned Viag industrial combine som months ago, has now taken over plant, property and limesto quarries of the Polish nitrogen plant of Chorzov, at a pric 28 million marks, which has been paid to another Governm organisation. The new company has a capital of 30 mill marks, and is to operate the fertiliser plant independent though in close co-operation with existing German cartels.